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ABSTRACT

This paper combines records from the United States census with records from the Puerto Rican census and compares for the first time the fertility levels of Puerto Ricans who migrated to the United States with those of their counterparts who remained in Puerto Rico. The general hypothesis tested is that migration and residence in a place where low fertility is the norm results in lower fertility among the migrants than among those who remained at the place of origin. In general, the effect of migration to the mainland is considered to reduce fertility, but to a very small extent. Some evidence that this effect of migration on fertility is diminishing is stated to exist. Results of the analysis of the relationship between the ability to speak English and current fertility for urban island residents is held to indicate that those who speak English have considerably lower levels of current fertility than those who do not. The ability to speak English is seen to be an indicator of a whole cluster of attitudes and behaviors associated with what is labeled "modernism." The importance of micro-census data when addressing the issue of migration and fertility is stressed. (Author/AM)

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FERTILITY AND MIGRATION: THE CASE OF PUERTO RICO

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Abstract

This paper is an examination of the relationship between migration and fertility, using measures of current fertility and cumulative fertility. By combining records from the United States census with records from the Puerto Rican census it is possible, for the first time, to compare the fertility levels of Puerto Ricans who migrated to the United States with those of their counterparts who remained in Puerto Rico. In general, the effect of migration to the mainland is to reduce fertility; but this reduction is very small. Furthermore, there is some evidence that this effect of migration on fertility has been diminishing.

FERTILITY AND MIGRATION:

THE CASE OF PUERTO RICO

The effect of migration on fertility is primarily of interest when the areas of origin and destination differ with respect to reproductive norms and behavior. Typically, the area of origin is one of high fertility and the area of destination is one of low fertility. It is expected that migration itself and exposure to the milieu of low fertility will bring about lower fertility among migrants than among their nonmigrant contemporaries at place of origin. It is also expected that, having been socialized in an area of high reproductive norms and behavior, migrants will have higher fertility than their nonmigrant contemporaries at place of destination.

Of these two propositions, the latter has received the bulk of the research attention--for reasons of data availability. Since censuses and surveys are geographically bounded, it is quite common to have migrants and comparable nonmigrants at place of destination included in the same census or survey. However, migrants and comparable nonmigrants at place of origin are not included in the same census or survey unless the distances involved are relatively small.

In this paper, the fertility of Puerto Ricans who migrated to the United States is compared with the fertility of their nonmigrant counterparts who remained in Puerto Rico. We examine the effect on fertility of the migration itself and the subsequent exposure to a low-fertility milieu, rather than contrasting differential fertility socializations. To do so, we have combined the 1-in-100 Public Use Sample of the 1970 Census for the Commonwealth of Puerto Rico with the records of all United

States resident Puerto Ricans from the 1-in-100 Public Use Sample for the 1970 United States Census.

Since the 1940s, Puerto Rico has been characterized demographically by comparatively low mortality and high, but persistently declining, fertility rates. As a result, Puerto Rico has experienced high rates of natural increase. With the exception of the past few years, the annual rate of natural increase has been consistently above 2 percent since 1940. Rapid rates of natural increase, high rates of unemployment and underemployment, and the mechanization of agriculture have been the primary impetuses for migration. Industrial development in the urban areas of the island and the availability of employment on the mainland also have been contributing factors. The fact that Puerto Ricans are United States citizens and the advent of air transit between Puerto Rico and cities on the mainland have facilitated migration to the United States. Inexpensive and rapid transportation between Puerto Rico and New York (approximately $75, one way, as of this writing) has allowed for convenient return migration as well.

Previous research examining the issue of migration and fertility for Puerto Rico has been concerned with rural-to-urban migration (Myers and Morris, 1966; Macisco, Bouvier and Renzi, 1969; Macisco, Bouvier and Weller, 1970). But this research has been restricted to Puerto Ricans residing on the island. This is problematic because an increasing proportion of all Puerto Ricans do not reside in Puerto Rico (Zarate and Zarate, 1974; Taeuber, 1966). As can be seen from Table 1, in 1970 fully one-third of all Puerto Ricans were residing in the United States. The analysis reported here is based on a sample of all Puerto Ricans.

Table 1. Percentage Distribution of Persons of Puerto Rican Birth, Parentage or Residence, by Residence: 1950, 1960, 1970

Residence	Percent			Numbers (in thousands)		
	1950	1960	1970	1950	1960	1970
Total	100.0	100.0	100.0	2512	3242	4103
Puerto Rico	88.0	72.5	66.1	2210	2349	2712
U.S. Mainland	12.0	27.5	33.9	301	893	1391
Puerto Rican born	9.0	19.0	19.7	226	617	810
Puerto Rican parentage	3.0	8.5	14.2	75	275	581

Source: U.S. Bureau of the Census, 1970 Census of Population, Puerto Ricans in the United States, PC(2)-1E, Table 1, p. xi; U.S. Bureau of the Census, 1970 Census of Population, Number of Inhabitants, Puerto Rico, PC(1)-A53, Table 1, pp. 53-59.

Measuring Migration Status

The two principal means of obtaining migration data from the 1970 Censuses are questions on place of birth and questions on place of residence in 1965. Both are used here, but both are unsatisfactory. Place of birth is problematic for a number of reasons. First, there is limited variation--almost 90 percent of the Puerto Rican women of childbearing age residing in the United States in 1970 were born in Puerto Rico. Perhaps more critically, place of birth data do not indicate what share of a person's life was spent at the birthplace. Presumably, a large but unknown proportion of Puerto Rican women who grew up on the mainland were born in Puerto Rico. Similarly, it cannot be determined where women born in the United States and currently residing in Puerto Rico spent their formative years.

The question on place of residence in 1965 allows classification of mainland and island residents by whether they lived in Puerto Rico or the United States in 1965. As such, it provides a valuable, but limited, piece of the person's residence history. The liability of having a limited migration history is intensified because the Puerto Rican migration is so fluid. Partly because of the availability of inexpensive and rapid transportation, there are numerous limited-duration migrations. An indication of this can be gained from a question asked on the Census for the Commonwealth of Puerto Rico: All persons were asked whether, during the last five years, they had lived in the United States at any time for six months or more. Comparing the answers to this question with those on place of residence in 1965 shows that two-fifths of the

current island residents who had lived in the United States for six months or more in the past five years were not living in the United States in 1965. Thus place of residence in 1965 underestimates recent migration; and, more seriously, it provides no information on migrations of longer duration.

Place of birth and place of residence in 1965 relate to migration between Puerto Rico and the mainland. Unfortunately, effective examination of the rural-urban dimension of Puerto Rican migration is impossible. First, for Puerto Ricans who migrated to the mainland, place of origin with respect to the rural-urban dimension was not coded. They are simply coded as missing data because they did not live within the United States in 1965.

Second, the 1970 Commonwealth Census classifies all current island residents who lived in the United States in 1965 as having a nonmetropolitan place of residence in 1965. Since the vast majority of these women were living in New York City in 1965, the code presumably is meant to indicate that the person was not living in a Puerto Rican metropolitan area in 1965. Nevertheless, the group of island residents classified as nonmetropolitan in 1965 contains an unusable mixture of former metropolitan island residents, former nonmetropolitan mainland residents, and former metropolitan mainland residents. As a result of these coding practices, we will not explicitly examine the migration and fertility relationship for rural-to-urban migration. Rather, the principal concern here will be with the influence of residence on the mainland vis-a-vis residence on the island.

Other Methodological Issues

Two dependent variables will be used. The first, a measure of recent or current fertility, is the number of own children under age 3. The second measure, one of cumulative fertility, is the number of children ever born to the woman. Unless otherwise noted, the tabulations presented will be for all Puerto Rican women residing in either the United States or Puerto Rico who are currently married and under age 40.

In the examination of the migration effects, other variables such as age, initial parity, education, and husband's occupation will be controlled by means of a dummy variable multiple regression technique (Andrews et al., 1973). In the tables presented here, deviations from the overall mean are shown: "Gross deviations" are those found when no controls are exercised, and "net deviations" are those found when the effects of the other variables specified are controlled. When the results of the various regression analyses are presented, we indicate which variables are in the model; but the effects of other predictor variables, such as age or education, are not displayed. We note here that these variables generally have the expected relationship to fertility.

The merging of the mainland and island census tapes creates a number of analytical difficulties. The first involves husband's income. The economies of Puerto Rico and the United States are sufficiently dissimilar that the income variable has different meanings in the two censuses, even though the same coding procedures are used. This can be seen by examining the two distributions of husband's income. Two-thirds of the island residents earned less than $4000; the comparable figure for Puerto Rican

mainland residents is one-fourth. For this reason, when utilizing the combined sample, husband's income has not been used; instead, husband's occupation has been relied upon.

It should also be noted that of single Puerto Rican women a greater proportion of those living on the mainland than of those living on the island have had children (Table 2)[1]. For example, 20 percent of the never-married Puerto Rican women aged 20-24 and residing in the United States have had children, but among comparable island residents only 3 percent have had children. While it may be tempting to examine these comparisons and think about the corrupting influence of New York City, an equally plausible and less pejorative explanation is that some of these "never-married" women are actually consensually married--an explicit option on the Puerto Rican census but not on the mainland census schedule. If the latter is the case, then our stateside sample is missing a number of currently married women. However, we expect that the effect of this is minimal.

Migration and Current Fertility

This section contrasts the recent fertility of Puerto Ricans who migrated to the United States with the fertility of those who did not; it is expected that those who migrated will have lower current fertility than those who remained in Puerto Rico. The underlying hypothesis is that the migration and the exposure to the reproductive norms and behavior found on the mainland result in lower current fertility. However, the reverse--lower fertility facilitating migration--cannot be excluded, given the cross-sectional nature of our data.

Table 2. Percentage of Never-Married Puerto Rican Women Who Have Had Children, by Age and Place of Residence: 1970

Place of Residence	15-19	20-24	25-29
Puerto Rico	1	3	6
United States	4	20	33

In Table 3, all Puerto Rican women have been classified into four groups on the basis of their place of residence in 1965 and 1970. The gross deviations, those deviations obtained when no other variables are controlled, indicate that long-term mainland residents and recent-return migrants have lower current fertility than the long-term island residents. But, unexpectedly, recent migrants to the mainland have the highest current fertility rates. After the effects of age, initial parity,[2] education of wife, and husband's occupation are accounted for, recent migrants to the mainland, as expected, have lower rates of current fertility than their contemporaries who remained in Puerto Rico. The primary reason for the large difference between the gross and net deviations for recent migrants to the United States is their age distribution; recent migrants to the United States are heavily concentrated at ages 20-29, which are the peak years of fertility.

The residence classification in Table 3 is based on the residence history of the wife. If the residence history of the husband is used instead (not shown), essentially the same results are found: The three groups known to have lived in the United States at some time have lower current fertility than those who resided in Puerto Rico at both time periods. If place of birth of the wife is also controlled (not shown), the same results are found.

The lowest current fertility is found among those who recently returned to Puerto Rico. For this group, it is quite possible that the low rates of recent fertility facilitated the return migration, rather than the reverse. Given the present data, we cannot distinguish between these two possibilities.

Table 3. Gross and Net Deviations from Mean Number of Children under Age 3 by Current Residence and Residence in 1965 for Currently Married Puerto Rican Women under Age 40

Residence		Gross Deviations	Net Deviations[1]	Number of Women[2]
Current	1965			
U.S.	U.S.	-0.013	-0.015	1328
U.S.	P.R.	0.105	-0.011	190
P.R.	P.R.	0.008	0.016	2159
P.R.	U.S.	-0.109	-0.078	174

Grand Mean = 0.505

[1] Controlling for age, initial parity, education, and husband's occupation.

[2] Women with missing data on place of residence have been excluded.

While the differences are in the expected direction for the other groups, these differences are very small. Since most of the mainland residents are also urban residents, it is possible that what is being attributed to mainland migration might be a function of urban residence. If education, age, initial parity, and husband's occupation are controlled, there are substantial rural-urban differentials: In the past three years, rural women have had an average of 0.54 children and urban women have had an average of 0.49 children.

Since 98 percent of the Puerto Rican mainland residents are also urban residents, both variables should not be entered into the same equation. As an alternative, a new residence history variable has been created that further subdivides the stable island population into its rural and urban components. This is shown in Table 4. As before, the lowest levels of net current fertility occur among those who have recently returned to the island; and, as would be expected, the highest levels of fertility are found among stable rural residents of Puerto Rico. Among the other three groups, long-term mainland residents have the lowest rate of current fertility and urban residents of Puerto Rico have the highest rate--but the net differences are exceptionally small. This suggests that the mainland effects are small.

Table 5 shows gross and net deviations for the place of birth categories. Women born in the United States have substantially lower current fertility than comparable women born in Puerto Rico. Even when current residence and residence in 1965 are controlled, the place of birth differential remains. Women whose place of birth was neither the United States nor Puerto Rico have lower current fertility than women who

Table 4. Gross and Net Deviations from Mean Number of Children under Age 3 by Current Residence, Residence in 1965, and Rural-Urban Residence for Currently Married Puerto Rican Women under Age 40

Residence		Gross Deviation	Net Deviation[1]	Number of Women[2]
Current	1965			
U.S.	U.S.	-0.013	-0.016	1328
U.S.	P.R.	0.105	-0.011	190
Rural P.R.	P.R.	0.085	0.056	879
Urban P.R.	P.R.	-0.046	-0.009	1280
P.R.	U.S.	-0.109	-0.080	174
		Grand Mean = 0.505		

[1]Controlling for age, initial parity, education, and husband's occupation.

[2]Women with missing data on place of residence have been excluded.

Table 5. Gross and Net Deviations from Mean Number of Children under Age 3 by Place of Birth for Currently Married Puerto Rican Women under Age 40

	Gross Deviation	Net Deviation[1]	Net Deviation[2]	Number of Women
P.R.	0.012	0.009	0.007	3606
U.S.	-0.081	-0.082	-0.069	328
Other[3]	-0.155	-0.053	-0.028	118

Grand Mean = 0.502

[1]Controlling for age, initial parity, education, and husband's occupation.

[2]Controlling for age, initial parity, education, husband's occupation, and wife's residence history.

[3]"Other" includes foreign-born women as well as those born in other United States possessions.

were born in Puerto Rico; a substantial proportion of these women were born in Cuba.

Migration and Children Ever Born

In order to allow what perhaps may be a rather small effect of migration to the mainland to cumulate and thus become more visible, in this section we examine the relationship between migration and fertility, using children ever born as the dependent variable, among currently married women aged 35-44 and among currently married women aged 45-54. Unfortunately, it is necessary to rely on the classification by current residence and by residence in 1965. For those who migrated in either direction in the five years preceding the census, the level of cumulative fertility probably has a greater influence on the migration decision than the migration has on fertility. For this reason, the two categories of recent migrants will be benignly neglected in our discussion. Of course, the problem of fertility affecting the migration decision is a concern for the other categories as well, but presumably not as serious a concern.

The results of the multiple regression analyses for women aged 35-44 and for women aged 45-54 are shown in Table 6. Controlling for education of wife and occupation of husband among women aged 35-44, long-term mainland residents have had 0.25 children less than their urban island counterparts. The comparable differential among women aged 45-54 is 0.90 children. Including place of birth in the model does not change these differentials. Thus the expected differential between mainland residents and urban island residents is found when the dependent variable is children ever born.

Table 6. Gross and Net Deviations from Mean Number of Children Ever Born by Current Residence and Residence in 1965 for Currently Married Puerto Rican Women Aged 35-44 and 45-54

Residence		Women Aged 35-44				Woman Aged 45-54			
Current	1965	Gross	Net[1]	Net[2]	Number of women[3]	Gross	Net[1]	Net[2]	Number of women[3]
U.S.	U.S.	-0.558	-0.389	-0.412	508	-1.142	-0.988	-0.977	262
U.S.	P.R.	0.431	0.203	0.204	41	-1.330	-1.531	-1.554	8
Rural P.R.	P.R.	1.488	0.827	0.826	356	1.801	1.178	1.159	301
Urban P.R.	P.R.	-0.414	-0.156	-0.135	557	-0.395	-0.089	-0.085	436
P.R.	U.S.	-0.570	-0.315	-0.312	58	-1.939	-1.446	-1.405	31
		Grand Mean = 3.984				Grand Mean = 4.455			

[1]Controlling for wife's education and husband's occupation.

[2]Controlling for wife's education, husband's occupation, and place of birth.

[3]Women with missing data on place of residence in 1965 have been excluded.

That this relationship between migration and fertility is barely found for a current fertility measure but is found for a measure of cumulative fertility suggests two possibilities, both of which are probably partially true. First, the effect is small and thus not very visible on a current fertility measure. Second, as the island industrializes and modernizes, differences between urban sectors of the island and urban sectors of the mainland are decreasing. This reduction in differences has probably increased as the number of former mainland residents has increased. As already noted, one characteristic of the Puerto Rican migration, which began after World War II and has continued through the present, has been the high volume of return migration. Thus, differentials in children ever born probably reflect a series of differentials that have been contracting in recent years. This possibility is consistent with the fact that the differential in children ever born was considerably greater among women aged 45-54 than among women aged 35-44.

Knowledge of English and Current Fertility

Another perspective on the influence of the mainland can be gained by examining whether or not the husband or wife can speak English. This information is only available from the Commonwealth Census and not from the stateside census. Thus, the analysis in this section will be restricted to currently married women who resided in Puerto Rico in 1970. The analysis will be further restricted to urban residents in order to remove the rural-urban differences.

On the 20 percent questionnaire, the respondent was asked for each member of the household, "Can this person speak English?" Among urban

currently married women under age 40, slightly less than three-fifths of the wives and slightly more than two-thirds of their husbands can speak English. Of course, this is more than the proportion of island residents who resided in the United States for six months or more during the five years preceding the census. Presumably this variable, the ability to speak English, reflects an unknown mix of modernization, education, having sometime resided on the mainland, and having been in contact with people who resided on the mainland. The ability to speak English as an indicator of these latter two concepts is of primary interest here; unfortunately, it is impossible to fully separate out the effect of the former two.

When age, initial parity, education, and husband's occupation are controlled, the current fertility level of wives who speak English is almost one-eighth lower than the level for wives who do not speak English (Table 7). If the classificatory variable is the husband's ability to speak English, rather than the wife's, somewhat larger differentials appear. These differentials are substantial, and do not diminish when husband's income and residence history are entered into the regression model.

Discussion

In this paper we have examined the relationship between migration and fertility. By combining the census records of Puerto Ricans living in the United States with census records of Puerto Ricans living in Puerto Rico, it was possible for the first time to compare the fertility of migrants with the fertility of comparable nonmigrants at place of origin. The general hypothesis was that migration and residence in a place where

Table 7. Gross and Net Deviations from Mean Number of Children under Age 3 by Whether the Wife Can Speak English and by Whether the Husband Can Speak English, for Currently Married Women Residing in Urban Areas of Puerto Rico and under Age 40

Speak English	Gross Deviation	Net Deviation[1]	Number of Women
Wife:			
Yes	-0.027	-0.026	861
No	0.035	0.033	663
Husband:			
Yes	-0.025	-0.023	1039
No	0.054	0.049	485

Grand Mean = 0.449

[1]Controlling for age, initial parity, education, and husband's occupation.

low fertility is the norm would result in lower fertility among the migrants than among those who remained at the place or origin.

However, there is essentially no difference between the current fertility of urban island residents and of recent migrants to the mainland, when age, initial parity, education, and husband's occupation are controlled. Nor do these groups differ significantly from long-term residents of the United States. There were, however, substantial differences between these three groups and rural island residents, suggesting that what might have originally been attributed to migration is a function of urban residence; thus, little, if any, effect was found for migration to the mainland.

To see if the effect of migration might be more visible on a measure of cumulative fertility, the relationship between migration and children ever born was examined. The net differences found between long-term mainland residents and their urban island counterparts were substantial--especially among the older cohort. Part of the explanation for different sets of findings is that a comparatively small effect will be more visible on a cumulative measure than on a current measure. However, the difference between the two cohorts suggests that the effect of migration is diminishing. The reason for the diminishing effect is twofold: Puerto Rico is becoming industrialized and modernized, and an ever increasing proportion of the island population has lived on the mainland.

Finally, the relationship between the ability to speak English and current fertility was examined for urban island residents. The results of this analysis are intriguing for the questions they raise rather than for the answers they provide. It was found that those who speak English have considerably lower levels of current fertility than those who do not,

even when such variables as age, initial parity, education, husband's occupation, husband's income, and residence history are controlled. If the ability to speak English is a proxy for either having resided on the mainland or having been in contact with persons who resided on the mainland, then this would suggest that the migration to the mainland has had a somewhat more pervasive effect on the island's fertility than the migration variables themselves indicate. Unfortunately, it is not possible to identify all urban island residents who have ever resided on the mainland.

Although part of the effect of the "ability to speak English" variable is a return migration effect, the principal part of the effect is probably the result of what might be termed "modernism." That sector of the population that is most likely to have acquired the ability to speak English is also the sector most likely to have lower levels of current fertility. As such, the ability to speak English is an indicator of a whole cluster of attitudes and behaviors associated with "being modern." Furthermore, it would be expected that if a similar measure were available for mainland Puerto Ricans, similar differentials would appear.

In addition to the substantive issues treated by this paper, it ought to be noted that the option of combining censuses will be increasingly available to researchers examining a variety of migration-related issues. When micro data are used in migration research, typically the sample or census consists only of migrants or migrants and their new neighbors. By not having a comparable sample of the migrants' former neighbors, the analyst dealing with migration is severely limited in the number of substantive issues that can be addressed.

As additional census bureaus or statistical offices release micro census data (Rowe, 1974), it will be possible not only to more adequately

address the issue of migration and fertility, but also to address a wide range of other issues. Even though combining national censuses will entail a number of methodological problems that are not ordinarily of concern, such as differential rates of underenumeration or differential patterns of age misstatement,[3] the added analytical power will outweigh the additional steps necessary to ensure comparability.

Notes

1. Allocation rates for the "children ever born" variable among single women are relatively high (see U.S. Bureau of the Census, 1973, Table A-2; Rockwell, 1975). However, the allocation rates among single Puerto Ricans on the island and among single Puerto Ricans on the mainland are about 40 percent lower than those for all single U.S. women.
2. Initial parity is the number of children the woman had prior to the period of current fertility being considered, that is, prior to 1967-1970.
3. Such problems were not a major concern here because the two censuses being combined were conducted by the same organization and subject to the same quality controls.

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